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the step of forming an electrode, or another semiconductor thin film and an electrode on a back surface of the semiconductor thin film thus peeled.

REMARKS

This application has been carefully reviewed in light of the Office Action dated November 4, 2002 (Paper No. 7). Claims 19, 21, 27, 29 and 30 are in the application, with Claims 21, 27 and 29 being withdrawn from consideration pursuant to an election of species requirement. Claims 19, 21, 27 and 30 are the independent claims. Reconsideration and further examination are respectfully requested.

Claim 30 was rejected under 35 U.S.C. § 102(e) over U.S. Patent No. 6,100,166 (Sakaguchi). Claims 19 and 30 were rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 5,397,713 (Hamamoto) in view of Sakaguchi. Claim 20, which was rejected under 35 U.S.C. § 103(a) over Hamamoto and Sakaguchi and further in view of U.S. Patent No. 4,303,463 (Cook), has been cancelled, with some of its subject matter being incorporated into Claims 19 and 30. Reconsideration and withdrawal of the rejections are respectfully requested.

The present invention as recited by amended Claim 19 concerns a method of producing a solar cell which includes the steps of: forming a separation layer on a substrate and forming a semiconductor thin film having a semiconductor layer of a first conductivity type and a semiconductor layer of a second conductivity type on the separation layer; bonding a light-transmitting flexible film onto the semiconductor thin film with a light-transmitting adhesive; securing an edge of the flexible film extending outwardly from the substrate to a thin film support member having a curved surface; rotating the thin film

support member while the flexible film is kept in contact with the curved surface of the thin film support member, thereby peeling the semiconductor thin film away from the substrate; and forming an electrode on a back surface of the semiconductor thin film thus peeled.

The present invention as recited by amended Claim 30 concerns a method of producing a solar cell which includes the steps of: forming a separation layer on a substrate and forming a semiconductor thin film on the separation layer; bonding a flexible film onto the semiconductor thin film with an adhesive; securing an edge of the flexible film extending outwardly from the substrate to a thin-film support member having a curved surface; rotating the thin film support member while the flexible film is kept in contact with the curved surface of the thin film support member, thereby peeling the semiconductor thin film away from the substrate; and forming an electrode, or another semiconductor thin film and an electrode on a back surface of the semiconductor thin film thus peeled.

Thus, according to one feature of the invention, the semiconductor film is peeled away by securing an edge of the flexible film extending outwardly from the substrate to a thin film support member having a curved surface, and rotating the thin film support member while the flexible film is kept in contact with the curved surface. By virtue of this feature, the peeled-away portion of the films can be supported by the curved member, making it easier to avoid damage to the films, such as damage caused by vibration or extension.

Hamamoto and Sakaguchi are not seen to teach or suggest the foregoing feature. The Office Action concedes that these references do not disclose a curved thin

film support member used to carry out peeling. See page 5, lines 1 to 3 of the Office Action.

Cook also is not seen to teach or suggest the foregoing feature.

Cook discloses a method in which a heated wheel (23) adds heat to achieve liquidation of material at an interface (21) so as to separate a layer (19) from a substrate (17). See Fig. 2 and col. 3, line 66 to col. 4, line 3 of Cook. Separation of Cooks' layer (19) is not effected by securing an edge of a flexible film to the heated wheel (23) and keeping the flexible film in contact with the heated wheel (23) during rotation.

As shown in Fig. 2 of Cook, the edge of the layer (19) is not secured to the heated wheel (23). Consequently, the peeled-away portion of layer (19) is not supported by the heated wheel (23), but it suspended in air, where it can be damaged by vibration or extension.

This is in direct contrast to present invention, in which the semiconductor film is peeled away by securing an edge of the flexible film extending outwardly from the substrate to a thin film support member having a curved surface, and rotating the thin film support member while the flexible film is kept in contact with the curved surface. For example, in the embodiment shown in Figs. 10A to 10E, an edge of the flexible film (4) extending outwardly from the substrate (1) is secured to the thin film support member (5), and the thin film support member (5) is rotated while keeping the flexible film (4) in contact with the curved surface of the support member. See page 12, line 7 to page 13, line 11 of the present specification.

Applicants therefore conclude that the applied references do not teach or suggest the claimed invention either singly or in the combination proposed by the Office

Action, even assuming that such combination can properly be made. It is therefore respectfully requested that the Section 102 and 103 rejections be withdrawn.

With regard to the non-elected claims, Claims 21 and 27 have been amended to be consistent with the changes made to Claim 30, and Claims 22 and 28 have been cancelled without prejudice or disclaimer of subject mater.

Applicants respectfully submit that Claim 30 is generic to Species I-A (Claim 19), Species I-B (Claim 21), and Species II (Claims 27 and 29). Generic Claim 30 is believed to be allowable and upon its allowance, Applicants submit that they are entitled to allowance of all claims directed to the species which are encompassed by generic Claim 30. See MPEP § 806.04(d).

No other matters being raised, it is believed that the entire application is fully in condition for allowance, and such action is courteously solicited.

Applicants' undersigned attorney may be reached in our Costa Mesa, California office at (714) 540-8700. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE TO CLAIMS

19. (Amended) A method of producing a solar cell, comprising:

the step of forming a separation layer on a substrate and forming a semiconductor thin film having a semiconductor layer of a first conductivity type and a semiconductor layer of a second conductivity type on the separation layer[,];

the step of bonding a light-transmitting flexible film onto the semiconductor thin film with a light-transmitting adhesive[,];

the step of [exerting an external force on the light-transmitting film and] securing an edge of the flexible film extending outwardly from the substrate to a thin film support member having a curved surface;

the step of rotating the thin film support member while the flexible film is kept in contact with the curved surface of the thin film support member, thereby peeling the semiconductor thin film away from the substrate[,]; and

the step of forming an electrode on a back surface of the semiconductor thin film thus peeled.

21. (Amended) A method of producing a solar cell, comprising:

the step of forming a separation layer on a substrate and forming a semiconductor thin film of a first conductivity type on the separation layer[,];

the step of bonding a light-transmitting flexible film onto the semiconductor thin film of the first conductivity type with a light-transmitting adhesive[,];

the step of [exerting an external force on the light-transmitting film and] securing an edge of the flexible film extending outwardly from the substrate to a thin film support member having a curved surface;

the step of rotating the thin film support member while the flexible film is kept in contact with the curved surface of the thin film support member, thereby peeling the semiconductor thin film of the first conductivity type away from the substrate[,];

the step of forming a semiconductor thin film of a second conductivity type on a back surface of the first semiconductor thin film thus peeled[,]; and

the step of forming an electrode on the semiconductor thin film of the second conductivity type.

27. (Amended) A method of producing a solar cell, comprising:

the step of forming a separation layer on a substrate and forming a semiconductor thin film having a first semiconductor layer of a first conductivity type and a second semiconductor layer of a second conductivity type on the separation layer[,];

the step of bonding an electroconductive flexible film onto the semiconductor thin film with an electroconductive adhesive[,];

the step of [exerting an external force on the electroconductive film and] securing an edge of the flexible film extending outwardly from the substrate to a thin film support member having a curved surface;

the step of rotating the thin film support member while the flexible film is kept in contact with the curved surface of the thin film support member, thereby peeling the semiconductor thin film away from the substrate[,]; and

the step of forming an electrode on a back surface of the semiconductor thin film thus peeled.

30. (Amended) A method of producing a solar cell, comprising:

the step of forming a separation layer on a substrate and forming a semiconductor thin film on the separation layer[,];

the step of bonding a flexible film onto the semiconductor thin film with an adhesive[,];

the step of [exerting an external force on the film to peel] securing an edge of the flexible film extending outwardly from the substrate to a thin film support member having a curved surface;

the step of rotating the thin film support member while the flexible film is kept in contact with the curved surface of the thin film support member, thereby peeling the semiconductor thin film away from the substrate[,]; and

the step of forming an electrode, or another semiconductor thin film and an electrode on a back surface of the semiconductor thin film thus peeled.